

### **REMARKS**

Claims 1 through 26 and 50 are pending and Claims 27 through 49 are canceled. Claims 1, 23 and 50 are amended. Support for this amendment can be found in the application as filed.

### **REJECTION UNDER 35 U.S.C. § 103**

#### **Applicants' Claimed Invention**

The use of catalysts in hydrocarbon conversion with an addition hydrogenation activity or hydrogenolysis activity that is too high can cause deleterious effects, e.g., loss of valuable compounds and damage to equipment and catalyst. For example, if the catalyst used in a xylenes isomerization/ethylbenzene dealkylation reactions has hydrogenolysis activity that is too high, ethylene formed in the dealkylation of ethylbenzene to ethylene and benzene can be cracked to methane. In addition, the ethylene cracking reaction generates a large amount of heat, which can cause large exotherms inside the reactor, which can lead to damage of the catalyst, equipment, or both. Still further, if catalysts used in aromatics conversion have an addition hydrogenation activity that is too high, the aromatic compounds can undergo aromatic ring saturation, which results in the loss of high value aromatics, e.g., xylenes.

The presently claimed invention, as set forth in Claims 1 through 26 and 50, involves treating a molecular sieve catalyst containing a Group VIIB or Group VIII metal with a catalyst treatment feed consisting essentially of hydrogen (which therefore must be substantially free of toluene) to reduce the addition hydrogenation activity of the catalyst by at least 10 percent (in comparison to the untreated catalyst) or the hydrogenolysis activity by at least 25 percent (in comparison to the untreated catalyst). Applicants' process is carried out by treating the catalyst with a feed consisting essentially of hydrogen (which therefore must be substantially free of toluene) under sufficient conditions of temperature and pressure and for a time of at least 4

hours to reduce the addition hydrogenation activity of the treated catalyst in an amount of at least 10 percent in comparison to the untreated catalyst. As shown in Examples 2 and 3 of the present application, the practice of the Applicants' invention substantially reduces the addition hydrogenation activity of the catalysts.

Applicants believe that the addition hydrogenation activity reduction is due to chemical bonding of hydrogen to the hydrogenation metal atoms. This bonding causes inactivation of at least a portion of the hydrogenation metal atoms. The hydrogen to hydrogenation metal bonding is a slow and difficult process that is dependent upon the hydrogenation metal present in the catalyst, the hydrogen pressure of the treatment, the temperature of the treatment, and the duration of the hydrogen exposure to the hydrogenation metal. Independent Claims 1 and 23 specify an extended hydrogen treatment time (treatment time of at least 4 hours).

#### **Rejection based on U. S. Patent 5,990,365**

Claims 1 through 26 and 50 stand rejected under 35 U.S.C. § 103 as being unpatentable over U. S. Patent 5,990,365 (Chang et al.). This rejection is specifically traversed as the invention, as set forth in presently pending Claims 1 through 26 and 50, is submitted to be patentable over Chang et al.

Chang et al. does not disclose or suggest treating a zeolite catalyst containing a Group VIIB metal or a Group VIII metal with feed that consists essentially of hydrogen. The feed of Chang et al. comprises hydrocarbons, e.g., toluene, and hydrogen with a molar ration of hydrogen to hydrocarbons (e.g., toluene) from 0.1 to 20 (Chang et al. column 8, lines 51-55). Applicants submit that the process conditions of Chang et al. would NOT inherently result in presently pending Claims 1 through 26 and 50 because the feed of Chang does not consist essentially of hydrogen. Applicants further submit that the process conditions of Chang et al. would NOT render applications' invention obvious because a feed comprising hydrogen and hydrocarbon is very

different from a feed consisting essentially of hydrogen where the catalyst is treated for at least four hours. The feed of Chang et al. comprises hydrocarbons, e.g., toluene, and hydrogen with a molar ration of hydrogen to hydrocarbons (e.g., toluene) from 0.1 to 20 (Chang et al. column 8, lines 51-55). Applicants submit that the process conditions of Chang et al. would NOT inherently result in presently pending Claims 1 through 26 and 50 because the feed of Chang does not consist essentially of hydrogen. Chang et al. column 8 lines 61-67 and column 9, lines 1-12 teach the effect of toluene on the catalyst. Further, Paragraph [0038] teaches that "the hydrogen treatment will usually result in the catalyst having at least 25 percent less hydrogenolysis activity in comparison to the untreated catalyst." The Office has suggest that the Applicant is solely making an Attorney argument; however, the effect of exposing the catalyst to a hydrocarbon feed is detailed both in Chang and in the specification. Further, the application details a possible explanation for the effect that is seen. The hydrogen bonds may be necessary to cause the inactivation of at least a portion of the hydrogenation metal atoms. The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. Chang details that even with the use of hydrogen, coke is still formed on the catalyst and the catalyst is aged. Therefore, the Applicant has shown that the addition of toluene will material affect the characteristics of the catalyst.

It is respectfully submitted that Chang et al. does not disclose or suggest presently pending Claims 1-26 and 50. Withdrawal of this rejection is respectfully requested.

**CONCLUSION**

Applicants respectfully submit that presently pending Claims 1 through 26 and 50 are patentable over Chang et al. Favorable action hereon is respectfully requested.

The Commissioner is hereby authorized to charge counsel's Deposit Account No. 05-1712, for any fees, including extension of time fees or excess claim fees, required to make this response timely and acceptable to the Office.

Respectfully submitted,

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